

HIGH ELECTRICAL QUALITY BURIED OXIDE IN SIMOX

ABSTRACT OF THE DISCLOSURE

A SIMOX (separation by implanted oxygen) process is provided that forms a silicon-on-insulator (SOI) substrate having a buried oxide with improved electrical properties. The process implements at least one of the following processing steps into SIMOX: (I) lowering of the oxygen ion dose in the base oxygen ion implant step; (II) off-setting the implant energy of the room temperature (RT) implant step to a value that is about 5 to about 20% lower than the base ion implant step; and (III) creating a soak cycle, i.e., pre-annealing step, prior to the internal oxidation anneal which allows dissolution of Si and SiO_x precipitates in the oxygen implanted region. The temperature and time of the soak cycle as well as the base implant dose are critical in determining the final BOX quality.